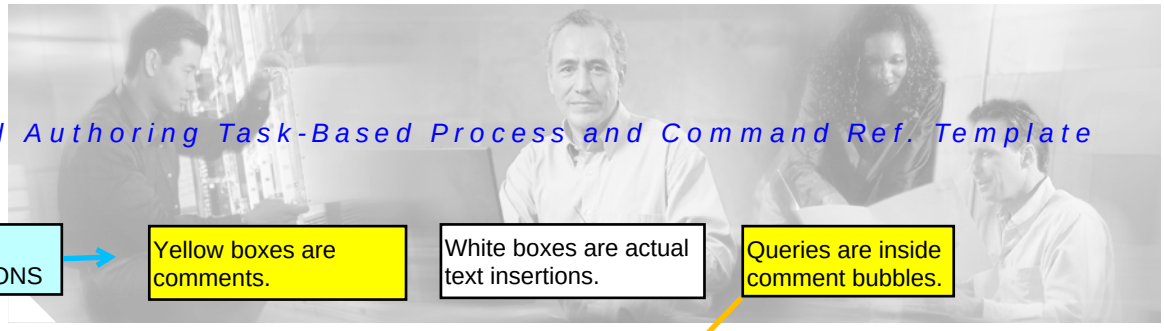


Edited Meredy Amyx 4/6/2004

MARKUP CONVENTIONS

Yellow boxes are comments.

White boxes are actual text insertions.

Queries are inside comment bubbles.

To start, we should use the feature name.

ATM OAM Support on GSR Line Card—dOAM

The ATM OAM Support on GSR Line Card--dOAM feature

Change d to s

Comma after "Administration"

Always capped: Route Processor [global]

Delete d and close up the space

This ragged little hand-drawn caret marks the insertion point.

ATM distributed Operations, Administration, and Maintenance (dOAM) ~~distributes OAM~~ cell processing to the line cards ~~(LCs)~~ instead of the route processor (RP), thus lowering the CPU load on the route processor. ~~By distributing the processing of OAM cells on the line cards, the CPU load is distributed on different line cards than centralized on the route processor.~~

Deleted because it says the same thing as the first sentence.

the

Cap. S

Feature History for ATM OAM support on GSR Line Card—dOAM

Feature

Release	Modification
12.0(28)S	This feature was introduced.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

Contents

Corporate Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Structured Authoring Task-Based Process and Command Ref. Template

Restrictions for ATM OAM Support on GSR Line Card—dOAM

Cap. S for feature name

The following restrictions apply to the ATM OAM support on GSR Line Card—dOAM feature:

- This feature supports *Engine 3* (This has to be confirmed from technical SMEs) ATM Line Cards on GSR platform.
- The OAM functionalities supported are:
  - F5 segment
  - F5 End-to-End
  - AIS Cells
  - RDI Cells
  - OAM enhancements made to support atom, including OAM Emulation and AIS generation.
- This feature does not support Engine 4xOC3 and Engine1xOC12 ATM line cards.
- The OAM functionalities that are not distributed to the line card, but are handled by the route processor are:
  - F4 Segment
  - F4 End-to-End
  - OAM F5 CC

the

No italics

as follows

lowercase (l.c.) l & c: line card

Sp. If "GSR" is going to be used (see Q on p. 1), it has to be expanded at first use.

Sp.

Cap. C needed?

Cap. or lowercase (l.c.)?

l.c. e

Delete period

Space here?

Delete comma

continue to be <?>

Cap. R & P, or just go ahead and use the acronym RP

Information About ATM OAM Support on GSR Line Card—dOAM

To configure

(dOAM)

For ~~dOAM~~-distributed OAM processing, you should understand the following concepts:

- Background: ATM OAM Support on GSR Line Card—dOAM, page 2
- General dOAM Architecture, page 2

Concept should have a descriptive title and not restate the feature functionality. Something like this?-- CPU Involvement in OAM Processing

~~Background: ATM OAM Support on GSR Line Card—dOAM~~

[Global] Just use "RP" from here on. I won't keep marking this.

OAM processing on the ~~route processors (RPs)~~ for large number of virtual circuits (VCs) is CPU intensive. Most of the CPU processing goes into transferring ~~the~~ OAM cells from the line card ~~(LC)~~ to the route processor and ~~the other way around~~. ~~By~~ distributing the processing of OAM cells ~~on~~ the line card, ~~the load on CPU is distributed on the different line cards~~ on the router.

Cap. D

Change "the other way around" to "back" or "vice versa."

Delete comma

Delete period

to

reduces the load on the CPU.

General dOAM Architecture

The following schema describes the process of distributing OAM processing to the line cards.

- Transfer of configuration information from the route processor (RP) to the line card ~~(LC)~~.

  The OAM configuration information from the route processor is transferred to the line card using XDR messages. Configuration messages are aggregated in the route processor and are sent to the line card. The default configuration message transfer interval is 4000 milliseconds.

- Transfer of counter information from the line card to the route processor.

  The OAM counters are transferred from the line card to the route processor periodically. The default interval at which the counters are transferred is 2000 milliseconds.

Sp. And this would be the right place for a brief explanation of XDR if needed.

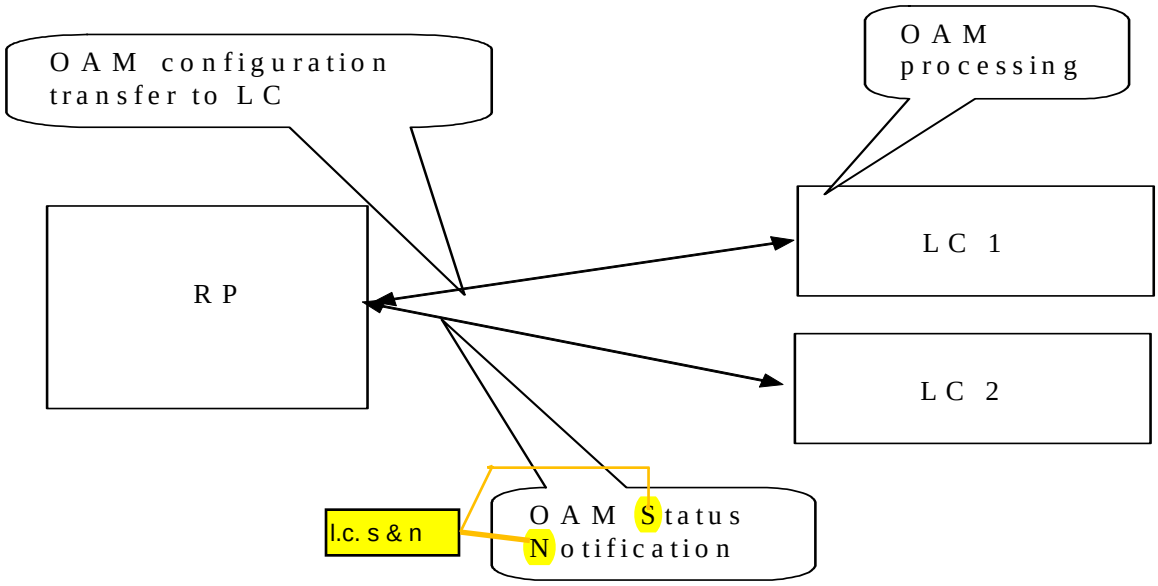
Structured Authoring Task-Based Process and Command Ref. Template

Figure needs caption with number and title. In-text reference should precede it. The paragraph above the figure should introduce it by number and include any necessary explanation. The note below and maybe also to bulleted list that follows it might be part of that paragraph.

- Transfer of state change information from the line card to the route processor.

  All OAM state change in the line card is transferred to the route processor immediately. The state change message in the route processor takes appropriate actions ~~like~~ such as bringing down or bringing up the virtual circuit state.

Figure 1. <Title>



Put into text reference above?

Note LC1 and LC2 are ~~two~~ line cards.

The work flow of OAM cell processing on the line cards ~~(LCs)~~ is as follows:

- OAM configuration information is transferred from the route processor to the appropriate line card.
- OAM processing based on this configuration happens in the line card.
- Upon OAM state change, the same notification is delivered to the route processor from the line card.
- ~~The route processor based on~~ the state change notification ~~will appropriately~~ bring down or bring up a virtual circuit.

The same as what? Don't see what it refers to.

Cap.C

According to

Insert comma

the RP

Add s

How to configure ATM OAM Support on GSR Line Card—dOAM

See the following sections for configuration tasks for this feature. The tasks in this list are ~~identified as~~ all optional.

There is another troubleshooting section (page 7), but they should be combined under one "Troubleshooting" head.

Configuring Distributed d A u t h o r i n g T a s k - B a s e d P r o c e s s a n d C o m m a n d R e f . T e m p l a t e

~~Distributing~~ OAM processing

Cap. P

By default, distribution of OAM processing is enabled. To modify the configuration and notification intervals, use the **atm oam distributed** command.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **Interface atm** *interface-number*
4. **atm oam distributed** [**config-interval** *configuration-interval-number* **notif-interval** *notification-interval-number*]

l.c. i

DETAILED STEPS

	Command or Action	Purpose

Step 1	`enable`
	
	Example:
	`Router> enable`
		Enables privileged EXEC mode.
		• Enter your password if prompted.

Step 2	`configure terminal`
	
	Example:
	`Router# configure terminal`
		Enters global configuration mode.

Step 3	`Interface atm configuration mode`
	
	Example:
	`Router(config-router)# interface atm1/1`
		Enters interface configuration mode.

Step 4	`atm oam distributed [config-interval 1000-60000 notif-interval 1000-60000]`
	
	Example:
	`Router(config-if)# atm oam distributed`
		Distributes the OAM processing to the Line Cards ~~(LCs)~~. By default, a value of 4000 milliseconds is applied to both the configuration interval and the notification interval.

l.c. i

These must match.

Mismatch with mode on the command page

l.c. L & C: line cards

These must appear as variables, as in summary steps above.

the

After the description (the FID), additional information appears as bullet points. Add bullet.

Expand in head: Virtual Circuits

Here in the example, you can use actual values in place of variables. Please see Alliene's notes on parsing commands.

Verifying the Status of VCs

This section helps you to verify your configuration and OAM ~~virtual circuit (~~VC~~)~~ state information in the ~~route processor (~~RP~~)~~ and the line card ~~(LC)~~.

To verify the OAM status information in the line card, use the **show atm oam** command.

SUMMARY STEPS

1. **enable**
2. **attach** *slot-number*
3. **enable**

Structured Authoring Task-Based Process and Command Ref. Template

4. **show atm oam** {**ATM** *interface-number vcd-number* | **auto-detect ATM** *interface-number* | **stats ATM** *interface-number*}

l.c. atm

also below

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode in the route processor (RP). • Enter your password if prompted.
Step 2	**attach** *slot-number* **Example:** `Router# attach 1`	Connects to the line card in slot ~~number~~ 1.
Step 3	**enable** **Example:** `LC-Slot> enable`	Enables privileged EXEC mode in the line card (LC). • Enter your password if prompted.
Step 4	**show atm oam** {**ATM** *interface-number vcd-number* | **auto-detect ATM** *interface-number* | **stats ATM** *interface-number*} **Example:** `LC-Slot# show atm oam stats ATM1`	Displays OAM configuration and OAM status information. Displays the number of VCs in different auto-detection and OAM VC states. Displays number of VCs in different OAM VC states.

Router

Delete hyphen and close up: autodetection

Bullets

the

Examples

The following is a sample output from the **show atm oam** command. It provides OAM configuration and OAM status information.

```
LC-Slot1# show atm oam atm1 44

ATM1: D: 44 VPI: 0, VCI: 64
OAM frequency: 0 second(s) OAM retry frequency: 1 second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM Loopback status: OAM Disabled
OAM VC state: Not Managed
OAM cells received: 0
F5 InEndloop: 0, F5 InSegloop: 0
F5 InAIS: 0, F5 InRDI: 0
OAM cells sent: 0
F5 OutEndloop: 0, F5 OutSegloop: 0
F5 OutAIS: 0, F5 OutRDI: 0
OAM cell drops: 0
```

Distributed OAM

Or other appropriate section head referencing the functionality and not the debug command. Put all troubleshooting content under this one head, and use subheads if necessary.

Troubleshooting—debug atm oam

about

Delete comma

This section helps you ~~to~~ troubleshoot your configuration. To display debugging information ~~of~~ OAM events, and OAM cell contents, use **debug atm oam** command.

the

Structured Authoring Task-Based Process and Command Ref. Template

Note Before issuing debug commands, see Important Information on Debug Commands

What is this referring to, and where is it? Is it needed before each and every use of a debug command? If it is a general warning, shouldn't we just give the warning and not a cross-reference to it?

SUMMARY STEPS

1. **enable**
2. **attach** *line-card*
3. **enable**
4. **debug atm oam** {**packet interface** *vcd* | **event interface** *vcd*}

DETAILED STEPS

Reminder to continue this change globally even though not marked in all instances.

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode in the ~~route processor (~~RP~~)~~. • Enter your password if prompted.
Step 2	**Attach** *slot-number* **Example:** `Router# attach 1`	Connects to the line card in slot ~~number~~ 1.
Step 3	**enable** **Example:** `LC-Slot> enable`	Enables privileged EXEC mode in the line card ~~(LC)~~. • Enter your password if prompted.
Step 4	**debug atm oam** {**packet atm** *interface-number vcd-number* | **event atm** *interface-number vcd-number*} **Example:** `LC-Slot# debug atm oam packet ATM1 3`	Displays ~~the~~ debugging information ~~of~~ OAM cell contents in ATM OAM packet. ~~Displays the debugging information of~~ OAM events ~~in ATM OAM event.~~

Same edits and Qs here as on p. 5

about

or

an

Examples

about

an

The following output example displays ~~the~~ debugging information ~~of~~ OAM cell contents in ATM OAM packet with vcd value.

Router

```
~~LC-Slot1#~~ debug atm oam packet atm1 28

SLOT 1:19:40:11: ATM OAM(ATM1) : VPI/VCI 0/102, type 1, func 8,pti 5
SLOT 1:19:40:11: Count 399 Length 56
 0x8 0x1C 0x0 0x3 0x0 0x0 0x6 0x6A 0x18 0x1 0x0 0x0 0x0 0x38 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF
0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF
0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x3 0x47
SLOT 1:19:40:11:
```

about

an

The following output example displays ~~the~~ debugging information ~~of~~ OAM events in ATM OAM event with vcd value.

Router

```
~~LC-Slot1#~~ debug atm oam event atm1 28
```

Structured Authoring Task-Based Process and Command Ref. Template

```
SLOT 1:19:37:02: ATM OAM LOOP(ATM1) I: VC 0/102 LoopInd:1 CTag:25, PT 5
SLOT 1:19:37:02: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:25, PT 5
SLOT 1:19:37:02: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:37:02: ATM OAM(ATM1): Timer: VC 0/102 Status:2 CTag:67 Tries:0
SLOT 1:19:37:02: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:68
SLOT 1:19:37:02: ATM OAM LOOP(ATM1) I: VC 0/102 LoopInd:0 CTag:68, PT 5
```

See note on p. 5. Refer to functionality, not command name. Explanation of XDR functionality needed. Combine under one "Troubleshooting" head & use subheads if needed.

Troubleshooting—debug atm xdr

Delete extra line of space.

This section helps you to troubleshoot your configuration.

about

To display the debugging information of the transfer of OAM configuration information from the route processor (RP) to the line card (LC) and OAM status change notification from the line card to the route processor, use **debug atm xdr** command either on the route processor or the line card.

the

RP

RP

This symbol means "transpose" (reverse the positions of the elements). In this case, the reason is parallel structure.

SUMMARY STEPS

1. **enable**
2. **debug atm xdr**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**debug atm xdr** **Example:** `Router# debug atm xdr`	Displays the debugging information of the transfer of OAM configuration information from the route processor (RP) to the line card (LC).

Apply changes made to this same sentence elsewhere.

Examples

about

The following output example displays the debugging information of the transfer of OAM configuration information from the route processor (RP) to the line card (LC).

Use block label (tag: BL_BlockLabel) without colon

In RP:

This is a "delete" symbol

As elsewhere

Router

```
gsr1#
2d01h: atm_rp_lc_timer(ATM1/1): Timer exp msg type 1
2d01h: atm_send_rp_lc_xdr(ATM1/1): sending msg ATM_RP_LC_OAM_CONF to slot 1
2d01h: atm_send_rp_lc_xdr(ATM1/1): vcd start 81, end 81
2d01h: atm_send_rp_lc_xdr: oam manage 1, auto 0, emulation 0
2d01h: OAM VC State Down Retry
2d01h: oam_freq 10, retry freq 1, down retry 5, up retry 3
```

Structured Authoring Task-Based Process and Command Ref. Template

Block label as above

In LC:

Router

```
gsr1#
SLOT 1:19:15:07: atm_lc_msg(ATM1): msg_sub 1, msg 44, slot 1
SLOT 1:19:15:07: atm_lc_oam_conf(ATM1): configuring start_vcd 28, end_vcd 28
SLOT 1:19:15:07: atm_lc_oam_conf: oam manage 1, auto 0 cell emulation 0
SLOT 1:19:15:07: oam_vc_state 0,
SLOT 1:19:15:07: oam_freq 15, retry freq 1, down retry 5, up retry 3
SLOT 1:19:15:07: oam ais rdi down 1 ais rate 0
```

Means "line break." Force a line break after "GSR."

Configuration Examples for ATM OAM Support on GSR Line Card—dOAM

This section contains the following configuration example:

- show run interface Command Output: Example, page 8

This is not an example of configuring the feature.

I.c. atm oam, and use character tag B_Bold or CN_CmdName.

show run interface Command Output: Example

No quotes around command names

Argument names were edited to match p. 11, but "number" might be considered superfluous. In any case, they should match.

The following is the sample output for the ATM OAM distributed command:

-number | Italics for these arguments | -number | arguments

Note If the configuration-interval and notification-interval ~~parameters~~ are set to default, the ~~command~~ "**atm oam distributed**" will not be visible in the "**show run int interface-number**" output.

command

Cap. R

No abbreviations for command names. Check tags. Italics for arguments.

```
router# show run interface atm1/1

Building configuration...

Current configuration : 196 bytes
!
interface ATM1/1
 no ip address
 no ip directed-broadcast
 atm oam distributed conf-interval 6000 notif-interval 2000
no atm enable-ilmi-trap
 no atm ilmi-keepalive
end
```

bold

The following is ~~the~~ sample output for the no form of the command:

Note Use **shut down** or **no shut down** command before issuing this command. ~~It~~ is not recommended ~~to disable~~ distributed OAM processing.

Disabling

Cap. R

```
router# show run interface atm1/1

Building configuration...

Current configuration : 160 bytes
!
interface ATM1/1
 no ip address
```

Structured Authoring Task-Based Process and Command Ref. Template

```
 no ip directed-broadcast
 no atm oam distributed
no atm enable-ilmi-trap
 no atm ilmi-keepalive
end
```

Additional References

The following sections provide references related to ATM OAM support on GSR Line Card—dOAM.

Related Documents

Please see Alliene's notes about this section. Also see the SAWG. The first column is for the topic that the user might want to look up, not for the title of the entire document. The second column is for the title of the book. The title is linked, but the URL itself does not appear.

Related Topic	Document Title
Using OAM for PVC Management	http://www.cisco.com/warp/public/121/oam.html
ATM OAM Traffic Reduction	http://www.cisco.com/en/US/products/sw/iosswrel/ps1829/products_feature_guide09186a00801039af.html
Troubleshooting PVC Failures When Using OAM Cells and PVC Management	http://www.cisco.com/warp/public/121/tech-oam.html
WC: Cisco IOS Wide-Area Networking Configuration Guide	http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/products_configuration_guide_book09186a0080080f69.html
WR: Cisco IOS Wide-Area Networking Command Reference	http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/products_command_reference_book09186a008008112a.html

Delete leading space

Standards

Please verify title, and style according to our conventions - use normal heading-style capitalization, and use italics.

Standards	Title
ITU-I Specification	I.610 SERIES I: INTEGRATED SERVICES DIGITAL NETWORK, Maintenance principles

MIBs

MIBs	MIBs Link
• No New or modified MIBs are supported by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Delete bullet

Include remainder of prescribed boilerplate text.

I.c. n

RFCs

RFCs	Title
No New or modified RFCs are supported by this feature.	—

Include remainder of prescribed boilerplate text.

Structured Authoring Task-Based Process and Command Ref. Template

Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/public/support/tac/home.shtml

Command Reference

only

This section documents new commands. ~~All other commands used with this feature are documented in the Cisco IOS Release 12.0 S command reference publications.~~

Use block label tag

New commands

- **atm oam distributed, page 11**
- **show atm oam, page 13**
- **debug atm oam, page 15**
- **debug atm xdr, page 19**

Use cross-reference style that does not show page numbers. Commands should be in alphabetical order.

Structured Authoring Task-Based Process and Command Ref. Template

atm oam distributed

Please follow this deletion through globally. We don't generally abbreviate "line card." Even if we did, we would expand it only once on the command page and not include both acronym and expansion at every occurrence.

Distributing of

To distribute the OAM processing to the line cards ~~(LCs)~~, use the **atm oam distributed** command in privileged EXEC mode. ~~The~~ OAM processing to the line cards (LCs) is enabled by default. To disable the distribution of OAM processing to the line cards (LCs), use the **no** form of the command.

Curly braces { } signify a required choice among alternatives. There are no alternatives here. If the argument is required, omit the braces and square brackets [ ]. If it is optional, omit the braces and keep the brackets.

atm oam distributed [**config-interval** {*configuration- interval-number*}] [**notif-interval** {*notification-interval-number*}]

No space after hyphen

no atm oam distributed [**config-interval** {*configuration- interval-number*}] [**notif-interval** {*notification-interval-number*}]

See note on p. 8. 'number' can probably be omitted, but argument has to be treated the same in all occurrences.

Syntax Description

config-interval *configuration-interval-number*	(Optional) ~~Configuration interval value can be 1000 through 60000 milliseconds. The default value is 4000 milliseconds.~~
notif-interval *notification-interval-number*	(Optional) ~~Notification interval value can be 1000 through 60000 milliseconds. The default value is 4000 milliseconds.~~

Configuration interval, in milliseconds. Range: 1000 to 60000. Default: 4000.

Don't allow this word to break

Notification interval, in milliseconds. Range: 1000 to 60000. Default: 4000.

Defaults

Distributing of OAM processing to the line cards is enabled by default.

~~The configuration and notification intervals are set at 4000 milliseconds by default.~~

Command Modes

Privileged EXEC

Mode mismatch

Command History

Release	Modification
12.0(28)S	This command was introduced.

Usage Guidelines

a

By default, the distribution of OAM processing to the line cards is enabled. To modify the configuration and notification intervals, you ~~need to~~ provide configuration-interval value and notification-interval value.

must

a

the

rather

If you use **no** form of this command, the OAM processing will be done in the route processor (RP) than on the line card (LC).

Examples

the

both

The following example shows distributing OAM processing to the line cards with ~~default~~ configuration and notification intervals set at 4000 milliseconds:

the default value of

Cap. R

```
router(config-if)# atm oam distributed
```

the

The following example shows distributing OAM processing to the line cards with configuration interval set to 1000 millisecond and notification interval set to 1000 milliseconds:

the

Cap. R

```
router(config-if)# atm oam distributed config-interval 1000 notif-interval 1000
```

Structured Authoring Task-Based Process and Command Ref. Template

Related Commands	Command	Description
	show atm oam	Displays the OAM status information in the line card ~~(LC)~~.
	debug atm oam	Displays ~~the~~ debugging output ~~of~~ ATM OAM distributed processes.
	debug atm xdr	Displays ~~the~~ debugging information ~~of~~ the transfer of OAM configuration information from the ~~route processor~~ (RP~~)~~ to the line card ~~(LC)~~ and OAM status change notification from the line card to the ~~route processor~~.

[Global] Put related commands in alphabetical order

for

about

Structured Authoring Task-Based Process and Command Ref. Template

show atm oam

Commands should be physically arranged in alphabetical order. This one comes last.

throughout

To display the OAM status information in the line card ~~(LC)~~, use the **show atm oam** command in privileged EXEC mode.

l.c. ATM in syntax because it is not case-sensitive

show atm oam {**ATM** *interface-number vcd-number* | **auto-detect ATM** *interface-number* | **stats ATM** *interface-number*}

Sp.

l.c. s

Syntax Description

ATM *interface-number vcd-number*	Displays the OAM Configuration and the OAM VC State information. ~~Interface is the~~ ATM interface name. The vcd-value can be 1 through 65536.
auto-detect ATM ~~*interface-number*~~	Displays the number of VCs in the different auto-detection states.
stats ATM ~~*interface-number*~~	Displays the number of VCs in different oam VC states on a particular interface.

Because you want to define each of these three elements separately, it would be best to break this row up into three rows - one for **ATM**, one for *interface-number*, and one for *vcd-number*. When the argument and keyword pair are essentially a unit, as are the other two, then it makes sense to keep them together in the same row with one description to serve them both.

Deleted because the same argument does not have to be described more than once in the table.

Cap. OAM

First define it before giving the range. Use a noun phrase that states what "vcd-value" is, including what unit it is measured in (for example, seconds) if it is anything other than a counting integer. Then give the range: "Range: 1 to 65536."

are

If interface number is not specified, the details of ~~the~~ all the interfaces ~~is~~ displayed.

Delete hyphen. Leave space.

Command Modes

Privileged EXEC.

Delete period

Command History

Release	Modification
12.0(28)S	This command was introduced.

I recommend against using "determine" in a technical context because it is ambiguous. It can mean "to set, to put into effect" or "to ascertain, to find out." Here, we don't know which it is. Please clarify.

[Global] Delete hyphen & close up space

Use this command to determine OAM configuration, OAM ~~virtual circuit (~~VC~~)~~ state, auto-detection states of ~~virtual circuits~~, and the number of ~~virtual circuits~~ in different OAM states.

VCs

VCs

autodetection

Examples

The following example displays OAM ~~auto-detect~~ status information:

the

The following sample output displays the number of ~~virtual circuits (~~VCs~~)~~ in different OAM virtual circuit states on ~~ATM1~~ interface.

"atm1"

Router

```
LC-Slot1# show atm oam stats atm1

ATM OAM statistics on ATM1

  OAM Loopback statistics:
    DownRetry    : 4
    UpRetry      : 0
    Verified     : 1995
    Not Verified : 12
```

as above

on

The following sample output displays the number of VCs in different auto-detection and OAM VC states ~~in~~ ATM interface atm1.

Enclose in quotes with the period outside: "atm1".

```
LC-Slot1# show atm oam auto-detect ATM1
```

l.c. atm1

Structured Authoring Task-Based Process and Command Ref. Template

```
ATM OAM statistics on ATM1

  OAM Loopback statistics:
    DownRetry    : 4
    UpRetry      : 0
    Verified     : 1995
    Not Verified : 12

  Auto Detection statistics:
    ATM OAM AUTO DETECT INIT   : 2046
    ATM OAM SENDING MONITORING : 0
    ATM OAM MONITORING         : 0

  Verified and Not Monitoring: 1995
```

Router

The following output example displays OAM configuration and OAM status information.

```
LC-Slot1# show atm oam atm1 44

ATM1: VCD: 44 VPI: 0, VCI: 64
OAM frequency: 0 second(s) OAM retry frequency: 1 second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM Loopback status: OAM Disabled
OAM VC state: Not Managed
OAM cells received: 0
F5 InEndloop: 0, F5 InSegloop: 0
F5 InAIS: 0, F5 InRDI: 0
OAM cells sent: 0
F5 OutEndloop: 0, F5 OutSegloop: 0
F5 OutAIS: 0, F5 OutRDI: 0
OAM cell drops: 0
```

Repeat the field description table here. Each command page should be complete and self-contained.

See show atm pvc for significant fields description shown in this example display.

Related Commands

Command	Description
atm oam distributed	Displays the OAM status information in the line card (LC).
debug atm oam	Displays the debugging output of ATM OAM distributed processes.
debug atm xdr	Displays the debugging information of the transfer of OAM configuration information from the route processor (RP) to the line card (LC) and OAM status change notification from the line card (LC) to the route processor (RP).
show atm vc summary	Displays the number of VCs in different OAM VC states on a particular interface. This command is available in RP.
show atm oam auto-detect	Displays the number of number of VCs in different auto-detection states. This command is available in the route processor (RP).
show atm pvc	Displays all ATM PVCs and traffic information. This command is available in the route processor (RP).

Move up to put in alphabetical order.

Structured Authoring Task-Based Process and Command Ref. Template

debug atm oam

for

To turn on ~~the~~ debugging output ~~of~~ ATM OAM distributed processes, use the **debug atm oam** command in privileged EXEC mode. To turn off debugging output, use the **no** form of this command or the **undebug** command.

debug atm oam {**event atm** *interface-number* | **packet atm** *interface-number*}

no debug atm oam {**event atm** *interface-number* | **packet atm** *interface-number*}

Add s

Syntax Description

event	Debug ATM OAM events.
packet	Debug ATM OAM cells.
atm *interface-number*	~~Interface is the~~ ATM interface name.

~~Defaults~~

~~No default behavior or values~~

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(28)S	This command was introduced.

the | keyword | Delete comma | the | keyword

Usage Guidelines

Use ~~**debug atm oam**~~ **event** ~~command~~ to debug OAM events, and ~~**debug atm oam**~~ **packet** ~~command~~ to debug OAM cell contents.

for

Examples

The following example turns on ~~the~~ debugging messages ~~about~~ ATM OAM packets

Router

```
LC-Slot1# debug atm oam packet atm1 28

SLOT 1:19:40:11: ATM OAM(ATM1) : VPI/VCI 0/102, type 1, func 8,pti 5
SLOT 1:19:40:11: Count 399 Length 56
```

No bold

```
 0x8 0x1C 0x0 0x3 0x0 0x0 0x6 0x6A 0x18 0x1 0x0 0x0 0x0 0x38 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF
0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF 0xFF
0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x6A 0x3 0x47
```

Table 1 describes the significant fields shown in the display.

p

I can't see any of these in the sample output shown.

Table 1 debug atm oam packet Field Descriptions

Field	Description
0	GFC (4 bits)
00	VPI (8 bits)
0066	VCI (16 bits)
A	Payload type field (PTI) (4 bits)

Structured Authoring Task-Based Process and Command Ref. Template

These do not appear to be in the sample output shown on p. 15.

Table 1 debug atm oam packet Field Descriptions (continued)

Field	Description
18	Header Error Correction (8 bits)
1	OAM Fault management cell (4 bits)
0	OAM LOOPBACK indicator (4 bits)
00	Loopback indicator value (8 bits)
00000038	Loopback unique ID, sequence number (32 bits)
FF6A	F's and 6A required in the remaining ATM cell, per UNI3.0

for

Examples

The following example turns on ~~the~~ debugging messages ~~about~~ ATM OAM event~~s~~:

Router

```
LC-Slot1# debug atm oam event atm1 28

LC-Slot1#
LC-Slot1# exit

gsr1#
SLOT 1:19:36:11: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:36:11: ATM OAM(ATM1): Timer: VC 0/102 Status:2 CTag:5D Tries:0
SLOT 1:19:36:11: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:5E
gsr1#
SLOT 1:19:36:26: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:36:26: ATM OAM(ATM1): Timer: VC 0/102 Status:1 CTag:5E Tries:0
SLOT 1:19:36:26: atm_lc_oam_setstate(ATM1): VC 0/102: newstate = Down Retry <- This is the
initial state after configuration
SLOT 1:19:36:26: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:5F
SLOT 1:19:36:27: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:36:27: ATM OAM(ATM1): Timer: VC 0/102 Status:1 CTag:5F Tries:1
SLOT 1:19:36:27: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:60
SLOT 1:19:36:28: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:36:28: ATM OAM(ATM1): Timer: VC 0/102 Status:1 CTag:60 Tries:2
SLOT 1:19:36:28: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:61
SLOT 1:19:36:29: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:36:29: ATM OAM(ATM1): Timer: VC 0/102 Status:1 CTag:61 Tries:3
SLOT 1:19:36:29: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:62
SLOT 1:19:36:30: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:36:30: ATM OAM(ATM1): Timer: VC 0/102 Status:1 CTag:62 Tries:4
SLOT 1:19:36:30: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:63
SLOT 1:19:36:31: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:36:31: ATM OAM(ATM1): Timer: VC 0/102 Status:1 CTag:63 Tries:5
SLOT 1:19:36:31: atm_lc_oam_setstate(ATM1): VC 0/102: newstate = Not Verified <-5 retries
and no answers -> PVC declared down

SLOT 1:19:36:31: ATM(ATM1): VC 0/102 failed to echo OAM. 6 tries
SLOT 1:19:36:31: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:64
gsr1#
gsr1#
SLOT 1:19:36:46: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:36:46: ATM OAM(ATM1): Timer: VC 0/102 Status:1 CTag:64 Tries:6
SLOT 1:19:36:46: ATM(ATM1): VC 0/102 failed to echo OAM. 7 tries
SLOT 1:19:36:46: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:65
gsr1#
SLOT 1:19:36:58: ATM OAM LOOP(ATM1) I: VC 0/102 LoopInd:1 CTag:21, PT 5
SLOT 1:19:36:58: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:21, PT 5
SLOT 1:19:36:59: ATM OAM LOOP(ATM1) I: VC 0/102 LoopInd:1 CTag:22, PT 5
SLOT 1:19:36:59: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:22, PT 5
```

Use bold only for what the user types.

Comment lines are set off with exclamation points (!).

Structured Authoring Task-Based Process and Command Ref. Template

```
SLOT 1:19:37:00: ATM OAM LOOP(ATM1) I: VC 0/102 LoopInd:1 CTag:23, PT 5
SLOT 1:19:37:00: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:23, PT 5
SLOT 1:19:37:01: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:37:01: ATM OAM(ATM1): Timer: VC 0/102 Status:1 CTag:65 Tries:7
SLOT 1:19:37:01: ATM(ATM1): VC 0/102 failed to echo OAM. 8 tries
SLOT 1:19:37:01: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:66
SLOT 1:19:37:01: ATM OAM LOOP(ATM1) I: VC 0/102 LoopInd:0 CTag:66, PT 5
SLOT 1:19:37:01: atm_lc_oam_setstate(ATM1): VC 0/102: newstate = Up Retry <- Received a
response to the loop-back cell
SLOT 1:19:37:01: ATM OAM LOOP(ATM1) I: VC 0/102 LoopInd:1 CTag:24, PT 5
SLOT 1:19:37:01: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:24, PT 5
SLOT 1:19:37:01: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:37:01: ATM OAM(ATM1): Timer: VC 0/102 Status:2 CTag:66 Tries:0
SLOT 1:19:37:01: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:67
SLOT 1:19:37:01: ATM OAM LOOP(ATM1) I: VC 0/102 LoopInd:0 CTag:67, PT 5
SLOT 1:19:37:02: ATM OAM LOOP(ATM1) I: VC 0/102 LoopInd:1 CTag:25, PT 5
SLOT 1:19:37:02: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:25, PT 5
SLOT 1:19:37:02: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:37:02: ATM OAM(ATM1): Timer: VC 0/102 Status:2 CTag:67 Tries:0
SLOT 1:19:37:02: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:68
SLOT 1:19:37:02: ATM OAM LOOP(ATM1) I: VC 0/102 LoopInd:0 CTag:68, PT 5
SLOT 1:19:37:03: ATM Timer Process(ATM1): VCD 28End Loopbk exp
SLOT 1:19:37:03: ATM OAM(ATM1): Timer: VC 0/102 Status:2 CTag:68 Tries:0
SLOT 1:19:37:03: ATM OAM LOOP(ATM1) O: VC 0/102 CTag:69
SLOT 1:19:37:03: ATM OAM LOOP(ATM1) I: VC 0/102 LoopInd:0 CTag:69, PT 5
SLOT 1:19:37:03: atm_lc_oam_setstate(ATM1): VC 0/102: newstate = Verified <- PVC is
declared up again

gsr1# show atm pvc 0/102

VC 0/102 doesn't exist on interface ATM1/0 - cannot display
ATM1/1: VCD: 28, VPI: 0, VCI: 102
UBR, PeakRate: N/A (UBR VC)
AAL5-LLC/SNAP, etype:0x0, Flags: 0xC20, VCmode: 0x0
OAM frequency: 15 second(s), OAM retry frequency: 1 second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM END CC Activate retry count: 3, OAM END CC Deactivate retry count: 3
OAM END CC retry frequency: 30 second(s),
OAM SEGMENT CC Activate retry count: 3, OAM SEGMENT CC Deactivate retry count: 3
OAM SEGMENT CC retry frequency: 30 second(s),
OAM Loopback status: OAM Received
OAM VC state: Verified
ILMI VC state: Not Managed
OAM END CC status: OAM CC Ready
OAM END CC VC state: Verified
OAM SEGMENT CC status: OAM CC Ready
OAM SEGMENT CC VC state: Verified
VC is managed by OAM.
InARP frequency: 15 minutes(s)
InPkts: 0, OutPkts: 0, InBytes: 0, OutBytes: 0
InPRoc: 0, OutPRoc: 0, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
Out CLP=1 Pkts: 0
OAM cells received: 53
F5 InEndloop: 53, F5 InSegloop: 0,
F5 InEndcc: 0, F5 InSegcc: 0, F5 InAIS: 0, F5 InRDI: 0
OAM cells sent: 137
F5 OutEndloop: 137, F5 OutSegloop: 0,
F5 OutEndcc: 0, F5 OutSegcc: 0, F5 OutAIS: 0, F5 OutRDI: 0
OAM cell drops: 0
Status: UP
```

Same comment as on p. 16.

Structured Authoring Task-Based Process and Command Ref. Template

This command page should have its own field description table.

~~See debug atm oam for significant fields description shown in this example display. It is an equivalent command for **debug atm oam** in the route processor (RP).~~

Table 2 describes the significant fields shown in the display..

This should be part of it. If this is the only significant field, then no other description is needed.

Table 2 debug atm oam event Field Descriptions

Insert period

Field	Description
OAM VC state	Displays the current OAM VC state.

Align these rules.

l.c L & C

Related Commands

Command	Description
atm oam distributed	Distributes the OAM processing to the Line Cards ~~(LCs)~~.
show atm oam	Displays the OAM status information in the line card ~~(LC)~~.
debug atm xdr	Displays ~~the~~ debugging information ~~of~~ the transfer of OAM configuration information from the ~~route processor (~~RP~~)~~ to the line card ~~(LC)~~ and OAM status change notification from the line card ~~(LC)~~ to the ~~route processor (~~RP~~)~~.
debug atm packet	Displays ~~the~~ debugging information ~~of~~ OAM cell contents. ~~This command is available in the route processor (RP).~~
debug atm oam	Displays ~~the~~ debugging information ~~of~~ OAM events. ~~This command is available in the route processor (RP).~~

Alphabetize

about

Structured Authoring Task-Based Process and Command Ref. Template

debug atm xdr

The same command is documented on p. 21. Should they be combined?

Treat "RP" and "line card" as marked elsewhere.

To debug the transfer of OAM configuration information from the route processor (RP) to the line card (LC) and to debug OAM status change notification from the line card (LC) to the route processor (RP), use the **debug atm xdr** command in privileged EXEC mode. To disable, use the **no** form of this command ~~or **undebug** command~~.

debugging

debug atm xdr

no debug atm xdr

Syntax is not the same as on p. 21.

This command has no arguments or keywords.

Syntax Description		
	~~**xdr**~~	~~Displays ATM XDR message content.~~

When a keyword is treated as part of the command name, it isn't documented separately as a keyword.

Defaults ~~No default behavior or values~~

Command Modes Privileged EXEC.

No need to repeat the command description.

Command History

Required section

Usage Guidelines

a

~~Use **debug atm xdr** command to debug the transfer of OAM configuration information from the route processor (RP) to the line card (LC) and OAM status change notification from the line card to the route processor.~~ Do not use this command in highly scalable environment. Use this command in the route processor.

Sentence ending with colon should immediately precede the example.

for

Examples The following example turns on ~~the~~ debugging messages ~~about~~ ATM XDR on the route processor (RP):

If this statement contains needed information, make a complete sentence of it and make it part of the introductory paragraph. But see also Q on p. 21.

Configuration of ATM PVC with OAM management in interface atm1/1.

In ordinary text, enclose in quotes: "atm1/1".

```
gsr1# configure terminal

Enter configuration commands, one per line.  End with CNTL/Z.
gsr1(config)# interface atm1/1

gsr1(config-if)# pvc 0/100

gsr1(config-if-atm-vc)# oam-pvc man

gsr1(config-if-atm-vc)# end

gsr1#
2d01h: atm_rp_lc_timer(ATM1/1): Timer exp msg type 1
2d01h: atm_send_rp_lc_xdr(ATM1/1): sending msg ATM_RP_LC_OAM_CONF to slot 1
2d01h: atm_send_rp_lc_xdr(ATM1/1): vcd start 81, end 81 <- Transferring configuration
information of PVC 0/100
2d01h: atm_send_rp_lc_xdr: oam manage 1, auto 0, emulation 0
2d01h: OAM VC State Down Retry
2d01h: oam_freq 10, retry freq 1, down retry 5, up retry 3
```

I don't see the debug command used here. Is this the output?

As on p. 16

Table 3 describes the significant fields shown in the display.

Structured Authoring Task-Based Process and Command Ref. Template

Table 3 debug atm xdr ~~OAM management~~ Field Descriptions

Field	Description
vcd start	Starting vcd of the aggregated configuration message.
oam manage	Displays whether OAM is managed.
auto	Displays whether ~~auto-detect~~ is enabled.
emulation	Displays whether OAM emulation is enabled.
OAM VC state	OAM VC state information.
oam_freq	OAM loopback frequency.
retry freq	~~Displays~~ OAM loop-back retry frequency.
down retry	~~Displays~~ down retry count.
up retry	~~Displays~~ up retry count.

VCD <?>
For all these "displays whether" fields, how does the user read the output? What is the value of the 0 or the 1? Please specify in the description.
autodetection
What is the unit of measure?
Cap. D
Cap. U

Examples

The following is the output ~~on enabling~~ **debug atm xdr** on the ~~route processor (~~RP~~)~~: of the command

Combine into one introductory sentence as noted on p. 19. But see also Q on p. 21.

l.c. s

OAM Status notification example in interface ATM1/1.

```
1w2d: atm_rp_distributed: type 50, len 21, slot 1, unit 1 subtype 1
1w2d: atm_rp_distributed(ATM1/1): msg ATM_LC_RP_VC_STATUS, len 21, slot 1, slot_unit 1
1w2d: atm_rp_oam_vc_status(ATM1/1):state 2, num_vc 1
```

Table 4 describes the significant fields shown in the display.

Table 4 debug atm xdr Field Descriptions

Field	Description
ATM_LC_RP_VC_STATUS	Status notification message.
State	OAM VC state.
num_vc	Number of VCs in the ~~above~~ state.

l.c. s to match the display
What does the displayed value mean?
specified

Related Commands

Command	Description
atm oam distributed	Distributes the OAM processing to the Line Cards (LCs).
show atm oam	Displays the OAM status information in the line card (LC).
debug atm oam	Displays the debugging output of ATM OAM distributed processes.
debug atm packet	Displays the debugging information of OAM cell contents. ~~This command is available in RP.~~
debug atm oam	Displays the debugging information of OAM events. ~~This command is available in RP.~~

Alphabetize and apply edits made elsewhere
duplicates

Structured Authoring Task-Based Process and Command Ref. Template

debug atm xdr

See Q on p. 19. Combine pages?

Apply same edits as elsewhere.

To debug the transfer of OAM configuration information from the route processor (RP) to the line card (LC) and to debug OAM status change notification from the line card (LC) to the route processor (RP), use the **debug atm xdr** command in privileged EXEC mode. To disable, use the **no** form of this command ~~or **undebug** command~~.

debugging

debug atm xdr atm *interface-number*

no debug atm xdr atm *interface-number*

Syntax Description

atm *interface-number*	~~Interface is the~~ ATM interface name.

Defaults

No default behavior or values.

Delete period

Command Modes

Privileged EXEC.

Command History

Release	Modification
12.0(28)S	This command was introduced.

Usage Guidelines

~~Use **debug atm xdr** command to debug the transfer of OAM configuration information from the route processor (RP) to the line card (LC) and OAM status change notification from the line card to the route processor.~~ Do not use this command in a highly scalable environment. Use this command in the line card.

Examples

of the

command when enabled

The following is the output ~~on enabling~~ **debug atm xdr** on the line card ~~(LC)~~:

Same questions and comments as on p. 19.

```
Configuration of ATM PVC with OAM management in interface atm1/1.
gsr1# configure terminal

Enter configuration commands, one per line.  End with CNTL/Z.

gsr1(config)# interface atm1/1

gsr1(config-if)# pvc 0/102
gsr1(config-if-atm-vc)# oam-pvc man
gsr1(config-if-atm-vc)# oam-pvc manage 15
gsr1(config-if-atm-vc)# end
gsr1#

gsr1#
SLOT 1:19:15:07: atm_lc_msg(ATM1): msg_sub 1, msg 44, slot 1
SLOT 1:19:15:07: atm_lc_oam_conf(ATM1): configuring start_vcd 28, end_vcd 28 <- OAM
Configuration information for VCs in the range between start_vcd and end_vcd.
SLOT 1:19:15:07: atm_lc_oam_conf: oam manage 1, auto 0 cell emulation 0 <- OAM parameter
values.
SLOT 1:19:15:07: oam_vc_state 0,
SLOT 1:19:15:07: oam_freq 15, retry freq 1, down retry 5, up retry 3
```

Structured Authoring Task-Based Process and Command Ref. Template

```
SLOT 1:19:15:07: oam ais rdi down 1 ais rate 0
gsr1#
```

Table 5 describes the significant fields shown in the display.

Same edits and Qs for these three as on p. 20

Table 5 debug atm xdr Field Descriptions

Field	Description
oam manage	Displays whether OAM management is enabled.
auto	Displays whether auto-detect is enabled.
cell-emulation	Displays whether OAM cell emulation is enabled.

Related Commands

Alphabetize and apply edits as elsewhere.

Command	Description
atm oam distributed	Distributes the OAM processing to the Line Cards (LCs).
show atm oam	Displays the OAM status information in the line card (LC).
debug atm oam	Displays the debugging output of ATM OAM distributed processes.
debug atm packet	Displays the debugging information of OAM cell contents. This command is available in the route processor (RP).
debug atm oam	Displays the debugging information of OAM events. This command is available in the route processor (RP).

Page break

In my opinion, a glossary section is not needed for this feature module. I would recommend deletion.

Glossary

Don't need all this. Just expand acronym on p. 2.

AIS—alarm indication signal. In a T1 transmission, an all-ones signal transmitted in lieu of the normal signal to maintain transmission continuity and to indicate to the receiving terminal that there is a transmission fault that is located either at, or upstream from, the transmitting terminal.

No italics

dOAM— distributed Operation, Administration, and Maintenance.

See Q on p.1

GSR—Cisco Gigabit Switch Router.

~~**LC**—Line Card.~~

Ok but could also be worked into the concepts section

OAM—Operation, Administration, and Maintenance. ATM Forum specification for cells used to monitor virtual circuits. OAM cells provide a virtual circuit-level loopback in which a router responds to the cells, demonstrating that the circuit is up and the router is operational.

Needed?

PVC—permanent virtual circuit (or connection). Virtual circuit that is permanently established. PVCs save bandwidth associated with circuit establishment and tear down in situations where certain virtual circuits must exist all the time. In ATM terminology, called a permanent virtual connection.

Not needed. Expand on p. 2.

RDI—remote defect indication.In ATM, when the physical layer detects loss of signal or cell synchronization, RDI cells are used to report a VPC/VCC failure. RDI cells are sent upstream by a VPC/VCC endpoint to notify the source VPC/VCC endpoint of the downstream failure.

Needed?

RP—Route Processor. Processor module on the Cisco 7000 series that contains the CPU, system software, and most of the memory components that are used in the router. Sometimes called a supervisory processor.

Explain where noted on p. 2

XDR— eXternal Data Representation. Standard for machine-independent data structures developed by Sun Microsystems. Similar to BER.

Structured Authoring Task-Based Process and Command Ref. Template

Delete this note if glossary is deleted.

Note Refer to *Internetworking Terms and Acronyms* for terms not included in this glossary.

Structured Authoring Task-Based Process and Command Ref. Template